official demands, almost daily calls for information have been received from parties not connected with the service. The result of this work is the collection of special bibliographies, which insures those consulting it a complete index of what has been accomplished in each special line of meteorology. As has been well said, the progress of meteorology is retarded, and labor therein wasted, owing to the impossibility of ascertaining what has been done in its various branches, — an experience which, as scientific men well know, is by no means confined to this science. The cost of time and labor to the government for the preparation of this work cannot be less than from twelve to fifteen thousand dollars; and the result of these labors has been the completion of a work which is of great value, both practically and scientifically, to the entire world. The catalogue in its present condition is valuable, and sufficient for the pressing needs of this service; but to view it in this light would evince a narrow and selfish disposition not in keeping with the scientific spirit of the age. At a cost of probably eight or ten thousand dollars, this work can be printed and distributed to the world as a monument and evidence of the growing scientific tendency of this nation. If such action is taken by Congress, the chief signal-officer has no doubt, from the willing spirit and hearty co-operation shown by leading scientists of other countries, that future international co-operation will secure by a system of rotation, from the various European governments, the publication of a series of supplements which will keep the world abreast of the steadily increasing volume of meteorological publications. A large number of American and foreign meteorologists and librarians have given largely of their time and energy in the compilation of this bibliography, as is shown by the fact that over one-half of the material has been contributed from foreign countries; so that the bibliography represents not only a large expenditure on the part of the United States, but also many years of additional gratuitous labor. The material could not be duplicated, and it would seem but a respectable reciprocity of exchange that the government should print the catalogue, so as to enable the voluntary contributors to avail themselves of the complete work. This fulfilment of obligations to contributors by a public catalogue is an act of justice; but, in addition, it should be considered that this bibliography will be of great practical value to the agricultural, commercial, engineering, and medical interests not only of the United States, but of the world."

The plan of this bibliography originated with Prof. Cleveland Abbe, who, in 1872, began a systematic collection of works bearing upon meteorology. Later on, he brought the matter to the attention of the leading European meteorologists; and at the meeting of the first meteorological congress, as well as at those of the international meteorological committee, it was indorsed, and steps were taken to carry out the plan. Dr. Hellmann and G. J. Symons were engaged in similar work; and at the Berne meeting of the international meteorological committee in August, 1880, letters of Dr. Hellmann were read, dated Jan. 20 and July 20, 1880, giving a detailed scheme for combining the various works and for the preparation of a catalogue, and embodying Mr. Abbe's proposal of August, 1879, as well as a similar one from Mr. G. J. Symons of London. The committee, however, resolved that each country be requested to furnish lists of observations, and that Messrs. Scott and Hellmann be a sub-committee to consider the means of carrying out Dr. Hellmann's scheme.

In the fall of 1881, Mr. Abbe wrote to Mr. Symons for more details as to his work. General Hazen, chief signal-officer, then decided to purchase the catalogues of both these gentlemen, with a view to their combination and completion by the Signal Office in case the international committee did not do this. In November, 1881, Mr. Symons was authorized to prepare, at the expense of the Signal Office, a copy of all meteorological titles in his collection; and in December, 1881, Mr. Abbe's cards were purchased.

Mr. Symons's catalogue was received in October, 1883; and on March 4, 1884, Mr. C. J. Sawyer, librarian of the Signal Office, was relieved from the care of the library, and, as bibliographer, ordered to devote his whole time to the completion of this work, which was then transferred from the library to the study-room division of the Signal Office.

At the second meeting of the international meteorological committee at Copenhagen, in August, 1882, Messrs. Scott and Hellmann reported that the Meteorological Office could not print the proposed catalogue, and that subscriptions were not practicable. They therefore recommended each meteorological service to publish a national bibliography, for which Hellmann's 'Repertorium der deutschen Meteorologie,' prepared in accordance with the ideas of the committee, and now just about to be published, should serve as a model. It need only be added that since 1882 the international meteorological committee have, with other meteorologists, acquiesced in the arrangement by which the Signal Service has undertaken to complete, and if possible publish, for its own and for general use, a general index to the literature of meteorology.

Up to April 12 of this year, Mr. Sawyer has been engaged on this bibliography, and his estimate of the number of independent titles, including the year 1881 (which date was adopted as the close of the bibliography), is fifty thousand. At that time he had finished the classification of these titles by subjects, and most of the subclassification, the author-index, etc.

Publications later than 1881 and prior to 1887 have been indexed, and will form a supplement, the work on which is almost completed.

So far, no provision has been made for the publication of this valuable work. The scientific as well as the practical value of the bibliography is so great, that its speedy publication is very desirable, even setting aside the danger of its being lost by accident to the building in which it is deposited. Once printed, it will result in a saving of time many times as great in value as the money required for its publication. Professor Abbe's endeavors have succeeded in making it a work of great magnitude, and one that will reflect the greatest credit upon the scientific and practical value of the work of our Signal Service.

SCIENTIFIC NEWS IN WASHINGTON.

Phenomenal Hot Wave and Mortality in Egypt. — Supplementary Reading in Public Schools. — The Annual Ring in Trees. — Temperance-Instruction in the United States.

Phenomenal Hot Wave and Mortality in Egypt.

THE United States consul-general at Cairo, in a despatch dated July 23, describes a condition of affairs, meteorologically, in Egypt this summer, that is really remarkable. He says, "On the night of the 15th of June a heat-wave spread itself over Egypt, and it has since remained continuously. In a residence of three summers here I have experienced nothing comparable to it. The days have given air like that from the blast of a fiery furnace, while the nights have been intolerable from heat. The death-rate throughout Egypt, which was already very high, suddenly mounted towards figures of decimation, and the destroyer has been reaping a great harvest of the dead. For the first week of this very hot weather the death-rate rose in Cairo from a little over 40 to 76.8. The next week it was 71.6; the next 79.1, succeeded for the fourth week by 77.7. These figures present the average. In Bodlac and Darb-el-Ahmar, two quarters of the city, the death-rate was respectively 103 and 86.5, in one case more than decimation, in the other very nearly decimation. Truly no Indian death-rate, except in periods of widespread and most fatal epidemics, reaches the present record in the Egyptian capital.

"For five years past the health of Cairo has been growing worse, and yet during these years a special detail of English sanitary experts has been supervising a khedival sanitary department, the main object of which has been to look after the health of the most crowded Egyptian communities. The sanitary administration costs the Egyptian Government annually about two hundred thousand dollars, not inclusive of publications and police service. The health of the large cities grows worse every year. The heavy summer death-rate begins earlier in Cairo than in Alexandria. Just now a decidedly increased mortality is prevalent in the latter, and, following precedent, it will be much greater in August. Last year the death-rate at one time in Alexandria was about equal to what it now is in Cairo. In some of the smaller cities the mortality has this year been greater even than the Cairo average, and about Damietta there has been typhus-fever of a very fatal character. The rise of the Nile produces great humidity, and during August,

September, and October no abatement of sickness may be hoped for. By the first of November a pleasing change comes, and from then until in the spring the temperature will be mild, the climate delightful, and health, for Egyptians, fairly good. It is gratifying, even under this burning sun and in hearing of these never-ending songs of death, to know that a season will come against which but few if any complaints may be entered.

"July 25. — The average death-rate for the week ended July 19, as shown in the health bulletin, reaches 97.2, while in Darb-el-Ahmer quarter it amounted to 126, and in Bodlac quarter to 100. Total deaths in this city were 685.

"The average maximum temperature for the same week was 106½° F.; extreme heat, 114½°. The average minimum temperature was 72⅛°; the extreme minimum, 72¼°. The observations are taken at the Khedival Observatory, at Abbaseieh, two miles north of Cairo, where the unobstructed sea-breezes produce a lower temperature than in the city or south of it. Were it not for the great relief in temperature at night, existence would be unendurable."

Supplementary Reading in Public Schools.

With the single exception of industrial training, says the editor of the miscellaneous discussions that will accompany the forthcoming report of the United States commissioner of education, no innovation has been made in the schools within the last few years for which so much is claimed, and from which such far-reaching results are expected by practical educators, as supplementary reading. To form a taste for good reading, and thus overcome the evil influences of pernicious, cheap literature, is the highest object which it is hoped to secure; but, apart from this, the use of the works of standard authors in connection with the regular readers, furnishes, according to the testimony of many superintendents, an excellent means of testing the pupils' ability to read understandingly, and at the same time imparts an interest to school-work which nothing else can. In some cities not only standard books, but instructive and entertaining periodicals, are provided. This is the case at Canton, O., where the effects are thus described: —

"These periodicals were used for class-reading supplementary to the text-book, thus giving freshness, additional interest, and instruction in the reading-exercises. Pupils were allowed to take the papers home for evening reading, and were also permitted to use them during school-hours, providing they had any spare time after the preparation of their lessons. The teachers find this school literature a valuable help in moral instruction and in the intellectual culture of the pupils. Providing reading-matter so elevating in tone and so attractive is the best and surest way of overcoming the habit of reading the trashy, demoralizing literature of the day. There is marked improvement in taste for reading noticeable in many instances. Some pupils who were formerly addicted to dime novels and other sensational reading have voluntarily abandoned that since we are furnishing them something better. A knowledge of history, of current events, of familiar facts in science, and language-culture, are some of the benefits resulting from this work."

At San Francisco, Cal., "the principals as a unit want supplementary reading-matter."

The school committee of Southbridge, Mass., say, "Supplementary reading, which has been gradually gaining ground for the past three years, is one of the most advantageous results of the system of free text-books. Its beneficial effects are plainly visible."

From Steubenville, O., comes the following: "Supplementary readers have now been in use long enough to enable us to judge of the results. These are very satisfactory. The children can read in any book of the grade of their reader, and not merely in the one which they have learned by heart from hearing its lessons read over and over, as was so often the case when but one reading-book was used in a grade, and the reading is far better in every respect."

In New Haven, Conn., "the method of teaching pursued requires much independent reading by pupils, and so the habit of reading is formed. Moreover, as supplementary to the school reading-books, standard authors are being introduced, and are read somewhat critically. We can well afford to teach a little less of arithmetic, if by so doing we can insure a love of good books, and a habit of reading that shall be a life-long benefit."

The report of the committee on books and supplies at Lowell, Mass., mentions the subject thus: "With regard to supplementary reading for the different schools, a very small quantity was purchased, though, had your committee acted according to its inclination, a generous sum would have been expended in this direction, as it is assured of the good resulting from a plentiful supply of choice and suitable reading-matter for all the different classes."

The Washington, D.C., teachers are told that "the supplementary books, to be read at sight, are second in importance only to the text-books. They should be used at least for one exercise each week. This part of the reading will show the practical results of the efforts of the teacher and pupils."

The New York City superintendent says, "The good that has been already accomplished by these supplementary readers suggests a more comprehensive application of the same general idea."

A number of titles have been lately added to the list of books authorized for use as supplementary readers in the Boston, Mass., schools.

At Bay City, Mich., a pupil must carefully read at least two books of a prescribed list before he is entitled to promotion to the next higher grade.

The opinion of Mr. George Howland, superintendent of the Chicago schools, is thus expressed: "One of the most serviceable aids in the teaching of reading, enriching the pupil's vocabulary, widening the range of his thought, and strengthening his grasp of words and their meaning, is a wise use of the supplementary readers which to a limited amount have been in use in our schools for four or five years. With these books, in which most of the words, though familiar, are employed in other relations, with a few new words interspersed, the forms and meanings of the words are more permanently fixed in the mind, the alertness of thought in seizing upon the new words greatly quickened, and an ever-increasing interest and power, both of thought and expression, secured, admitting the pupils to more fruitful fields in the domain of history, literature, and science. No outlay of money, I think, can be more usefully incurred than in furnishing a sufficient amount of well-selected books for supplementary reading."

The Annual Ring in Trees.

The second annual report of Prof. B. E. Fernow, chief of the division of forestry, Agricultural Department, has just appeared. It is full of interesting information and suggestions. The following interesting extracts are made from a brief discussion of the annual ring of trees: —

"We may touch here only briefly upon the influence of the annual ring, and that especially for the purpose of asserting the existence of the latter as such in all timber grown in the temperate zone, and to call attention to the difference of structure of the annual ring in different groups of timbers, as from the appearance of the annual ring alone the quality of the timber may be judged to some extent. In this the following three factors are to be taken into consideration: the absolute width of the rings, the regularity in their width from year to year, and the proportion of spring wood to autumn wood. The spring wood is characterized by less substantial elements (vessels of thin-walled cells in greater abundance), while the autumn wood is formed by thicker-walled cells, which therefore appear of darker color. In the wood of conifers, and in that of deciduous-leaved woods in which the vessels (appearing as pores on a transverse cut) are most frequent in the spring wood, the annual ring is usually very distinctly visible; while in those woods which, like birch, linden, maple, etc., have the pores (vessels) evenly distributed throughout the annual ring growth, the distinction is not so marked. Sometimes the gradual change in appearance of the annual ring from spring to autumn wood, which is due to the difference of its component elements, is interrupted in such a manner that seemingly a more or less pronounced layer of autumn wood can be recognized, which again gradually changes to spring or summer wood, and then finishes with the regular autumn wood. This irregularity may occur even more than once in the same ring. Such double or counterfeit rings, which can be distinguished from the true annual rings by a practised eye with the aid of a magnifying-glass, have led to the notion that the annual rings are not a true indication of age. The cause of such irregularity may be sought in some tem-

porary interruption of the vigorous functions of the tree, induced by defoliation, for instance, or by extreme climatic conditions, such as sudden changes of temperature, cold days followed by sudden warm weather, or droughts followed by rain.

"The absolute breadth of the annual ring depends on the length of the period of vegetation; also, the deeper and richer the soil, and the greater the influence of light upon the tree, the more of formative material can be produced by the tree, and the broader will be the annual ring.

"In coniferous wood the width of the autumn wood, with cells of thickened walls, is almost the same in width as in narrow annual rings, while the more porous spring wood changes in width with the general width of the annual ring. Consequently, on account of the more frequent occurrence of heavy autumn wood in a given volume of narrow-ringed wood than in that of wider-ringed wood, such wood is heavier, and, as a rule, narrow-ringed conifer wood is the better. And, with certain limitations, the opposite is true for broad-leaved trees which have their vessels chiefly in the spring wood, while those with the vessels distributed through the ring are less influenced in their weight and quality by the width of the annual ring. Slow-grown conifers and quickly-grown hard woods furnish, therefore, as a rule, the best quality.

"Besides the temperature of the atmosphere and the moisture conditions of the soil, it is the amount of light and consequent development of foliage which is perhaps the most powerful factor in wood-formations, other considerations not being unfavorable. In the proper use of this factor mainly has the forester the means of regulating the slower or quicker development, and consequently the quality of his crop."

Temperance-Instruction in the United States.

In the autumn of 1887 the Bureau of Education at Washington, desirous of obtaining a knowledge of the present status of temperance-instruction in the United States, addressed the following inquiry to the State superintendents: "Is the study of physiology and hygiene with special reference to the effects of stimulants and narcotics required by law, and in what grades?" From the replies it appears that instruction in physiology and hygiene with special reference to the effects of stimulants and narcotics is made compulsory by statute, in some part of their school-life, on all pupils in twenty-five out of the thirty-eight States; viz., Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Delaware, Maryland, West Virginia, South Carolina, Florida, Alabama, Michigan, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, Colorado, Nevada, Oregon, and California. The same compulsion exists in all the Territories and in the District of Columbia by United States statute. In Missouri the instruction under consideration is compulsory upon the demand of patrons of the public schools, and forbidden otherwise.

HEALTH MATTERS.

Seasickness.

NEW remedies for the prevention of seasickness continue to be brought forward. At a recent meeting of the Academy of Medicine of Paris, M. Bonnet presented the claims of antipyrine as a preventive. It was suggested, that as delegates from the academy to the meeting of the French Association for the Advancement of Science, to be held at Ivan, Algeria, were soon to sail for that place, an excellent opportunity to test the drug would thus be offered. M. Rollet, who went with the delegates, and who was exempt from seasickness, made a careful study of the subject, and contributes the results to the *Bulletin Médical*. The vessel sailed at four o'clock, and at six only four of the passengers remained at the table to finish dinner, although sixty had taken antipyrine, some of whom had begun the treatment three days before. He reports that antipyrine has no effect on seasickness.

In a previous number of *Science* we referred to another means to be adopted for the prevention of seasickness: to rub vigorously with the fingers the prominences behind the ears. An opportunity recently occurred to partially test this method. A party went for bluefish thirty miles off Sandy Hook. Two of them, at the first approach of the sickness, practised the rubbing and escaped; a third ridiculed it until thoroughly sick, and then gave it a trial, but without result; the others in the party were not sick, and of course had no occasion for the use of any preventive.

Still another remedy is oxalate of cerium. In a letter to the *New York Medical Record*, Dr. M. M. Waldron of Hampton, Va., writes, "The value of oxalate of cerium in seasickness has been known to me for years. Its application to this condition suggested itself from its supposed physiological action. . . . After repeated experiments on myself and others, I am satisfied that it will relieve more cases of seasickness than any remedy yet suggested. I have tested its efficacy both in coast and transatlantic voyages. Last summer I crossed the ocean with a party of friends. One of the number proved perverse, and would not take the remedy I offered. As the passage was somewhat rough, she was rewarded by being confined to her state-room during nearly the entire voyage. Another member of the party, hitherto a hopeless victim of seasickness, who had, in crossing the ocean fourteen times, made use of every known remedy without benefit, obtained decided relief from the oxalate of cerium. Two others, not 'good sailors,' took it regularly, from the time of going on board until the motion of the steamer ceased to be unpleasantly suggestive, and were kept from any serious symptoms, omitting, in all the passage, but one meal on a stormy night. The best results were obtained by fifteen-grain doses given every two hours. It can easily be taken dry on the tongue, and I belive this mode of administration is most effective."

Writing on this same subject to the same journal, Dr. W. H. Gardner, U.S.A., says, "I have been a traveller by land and water ever since I was able to toddle around, and have met many cases of seasickness, — in stages, ambulances, cars, boats, and ships, — and I can confidently assert that oxalate of cerium, administered in ten, fifteen, or twenty grain doses every two or three hours, in about one tablespoonful of water, will cure more cases than champagne, bromide of potassium, chloral, or any thing else I ever tried. I do not think I exaggerate when I state that it will cure, or materially relieve, seventy-five per cent of all cases that come up for treatment. . . . I have used the oxalate in hundreds of cases of sick-headache, and almost always with marked success; but it must be used in at least ten-grain doses for adults, to do any good. I have also found it very useful in relieving the cough of phthisis in these doses. I do not pretend to know its *modus operandi*, but believe it acts as a sedative to the pneumogastric and sympathetic system of nerves, and I have never seen any unpleasant effects from its administration in twenty-grain doses every three hours."

WARM AIR AT NIGHT. — Dr. Shepherd expresses in the *Lancet* the belief that consumption is due to a constant irritation of the air-passages, and that cold air breathed at night is one of the greatest irritants. Those who live most of the time in the open air are the least likely to suffer from phthisis, because their lungs are so accustomed to cold air as not to be irritated by it at night.

DISPOSAL OF GARBAGE IN BUFFALO. — A company has been incorporated at Buffalo for the purpose of manufacturing grease and fertilizers from the city refuse. The Vienna system has been adopted, and from twenty-five to fifty men besides teamsters will be employed. An ordinance requiring the separation of ashes and swill from garbage will be enforced, and the company will provide garbage-boxes, and collect, clean, and return them. The garbage will be removed in air-tight boxes and vehicles, and the factory is not expected to be in any way a nuisance.

CREMATION OF GARBAGE. — The Minneapolis Board of Health, after a study of the methods of garbage-disposal in Nashville, Chicago, and Milwaukee, has decided to construct a crematory for the burning of the garbage of that city. The furnace is expected to be smokeless, and to consume all solids and liquids. It is of a reverberatory construction, and receives the garbage on a grate some distance above an iron bottom plate that is intended to intercept and consume any falling material. The iron smoke-stack is to be one hundred feet high. The furnace is represented as no more of a nuisance on any street than a well-regulated livery-stable would be. In default of available municipal funds, the board of health has raised the necessary money among the citizens, and secured a remission of royalty upon the patent furnace. In connection with